Australian Government
Australian Centre for
International Agricultural Research

Sustainable Management of Soil in Oil Palm Plantings

ACIAR PROCEEDINGS 144

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Impact of practices on the comprehensive fertility of soil under oil palm

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Abstract

The project had objectives to assess the integration of soil organic matter and soil biota (micro- and macrofauna) in comprehensive fertility of oil palm agroecosystems and to develop knowledge toward a comprehensive fertility diagnosis to manage organic and inorganic fertiliser applications in a synergistic way.

Spatial variability around the palm was studied in five locations: Path, Path-Circle, Circle, Circle-Windrow and Windrow. In each location, samples of litter and soil were taken at two depths (15 and 30 cm). Analyses were done on the physical and chemical traits, on macrofauna, nematodes and micro-organisms. In litter, results showed that total macrofauna were abundant in all zones. In soil, the application of empty fruit bunches (EFB) on the Path zone induced significant changes in the Path and Path-Circle zones, but also in the Circle and even in the Windrow. Macrofauna had a significantly higher density in the Circle and Windrow zones than other areas. Analyses of nematodes, bacteria and fungi confirmed these trends. The 15–30 cm horizon had very low soil biota densities.

Temporal variability after EFB application was studied under the Path at 1, 3, 6, 12, 18, 24 months after EFB application. The results clearly indicated three periods—during the first period of 6 months, soil chemical and faunal traits were strongly changed. The second period (12 to 18 months) looked like a period of relative stability. After 24 months, most of the comprehensive fertility traits increased.

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